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NEW MACHINE TOOLS DESCRIBED

While in conventional milling the spindle rotates in a fixed position with the part fed in on a moving table, Soviet technicians have devised and put into use a standard power head for use on combination drilling and boring machines which performs both the milling and feed movements while the part remains stationary.

This standard head is also used on the Model A625 combination milling machine made by the Machine-Tool Plant imeni Ordzhonikidze. Rear axle housing plates can be milled with four cutters simultaneously when the standard head is used on this model. The A625 is a comparatively small machine measuring only 2,300 x 2,900 millimeters.

The drive system, which is analogous to the spindle box normally used on combination drilling and boring machines, is attached directly to the flange of the power head. The drive differs in that, instead of rotating the spindle itself, it turns four shafts on each of which is a bevel gear. Four spindles, each in a separate housing, are driven through bevel gears from their respective shafts. This design simplifies and lowers the cost of manufacturing gear boxes for milling spindles.

It should be noted that this system has not proved sufficiently rigid in combination milling machines where heavy milling is done. A more rigid gear box with the housings cast as a unit will have to be used for such work.

By the use of three standard power heads on one combination milling machine, all the surfaces of front axles can be milled simultaneously. This is possible even with large axles. Machining time is cut in half.

The Model A819 combination milling machine, similar to the A625 described above, is manufactured at the Stankokonstruktziya Plant. The A819 is designed for milling front axles for trucks. The rear head of this machine has a gear box with two high-power vertical spindles with which two surfaces are milled simultaneously at a speed of 146 meters per minute with the cutters at negative

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angles under spring tension. The lateral heads each contain one spindle which is equipped with two cutters, simultaneously machining the upper and lower surfaces of the corresponding boss. The machine has a two-position rotary table. The table is in one position during machining and in the other during removal and installation of the work part.

The essential advantage of combination milling machines is that they permit performing the operations of milling, drilling, boring and threading simultaneously on one machine.

The Model A882 combination milling machine, for instance, mills two surfaces and drills 17 holes in a truck rear axle housing. These operations are performed simultaneously in one spindle box driven by one power head.

The Model A437 combination milling machine mills the surfaces of bosses with one spindle, and with two other spindles (each having two cutters) mills gear housing lugs, while two lateral heads drill holes.

Model A821 mills the slanting surfaces of truck rear axles.

When bilateral longitudinal milling must be done, a "Dupleks" machine will be found more suitable and less expensive than other machines with standard power heads.

The Model 1A397 combination milling machine uses three heads, two for horizontal milling and one for vertical drilling. Its rotary table has four positions. Two parts are machined simultaneously.

The Model A822, A437, A821, 1A397, and 1A399 machine tools are manufactured at the Machine-Tool Plant imeni Ordzhonikidze.

The Stankokonstruktsiya Plant builds the Model 1A10 bilateral milling-boring-drilling machine for use on small parts such as automobile water pipes. Thirty-two-millimeter holes with an outside tolerance of 0.1 millimeters can be milled. Its table is a six-position rotary type.

The power head of the Model 1A403 machine has a spindle box containing six vertical milling spindles and 11 horizontal drilling spindles. Productive capacity on agricultural machinery units is 30 sets of parts per hour, at two parts per set.

Another product of the Machine-Tool Plant imeni Ordzhonikidze is the Model FTs special milling and centering machine. Two sides are machined simultaneously in self-centering vices.

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